NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE SPECIFICATION

WASTE TREATMENT LAGOON

(no.)
CODE 359

SCOPE

The work shall consist of constructing a waste treatment lagoon and appurtenances to the lines, grades, and elevations as shown on the drawings or as staked in the field. The installation shall be in conformance with the construction plans and these specifications.

The owner or operator shall be responsible for securing necessary permits.

SITE PREPARATION

Clearing

The entire pond or tank area shall be cleared of all trees, stumps, roots, brush, boulders, sod and debris. Topsoil containing more than 10% organic matter shall be removed.

All material cleared from the area shall be disposed of at sites away from the work area. Disposal of cleared material in existing waterways or channels will not be permitted. Disposal of material shall be in accordance to state and county laws.

Pond Foundation Preparation

The foundation area shall be cleared of trees, logs, stumps, roots, brush, boulders, sod, and rubbish. To establish vegetation, the topsoil and sod shall be stockpiled and spread on the completed pond. Foundation surfaces shall be sloped no steeper than 1:1. The foundation area shall be stripped of all loose material, and thoroughly scarified before placement of the first layer of fill material. The foundation surface shall have moisture added and compacted prior to fill placement.

The cutoff trench and other required excavations shall be cut to the lines and grades shown on the plans or as staked in the field. Suitable excavated materials as approved by the engineer shall be used in the permanent fill. All unsuitable material shall be stockpiled at the sites designated or disposed by the contractor.

Foundations, cutoff trenches and other parts of the construction site shall be dewatered and kept free of standing water or excessively muddy conditions as needed for proper execution of the construction work. The contractor shall furnish, install, operate and maintain all drains, sumps, pumps, casings, wellpoints, and other equipment needed to perform the dewatering as directed by the engineer.

The contractor shall build, maintain, and operate all temporary diversion and protective works needed to divert stream flow and other surface water through and around the construction site and away from the construction work while construction is in progress.

Earthwork

Excavation

The required excavation shall conform to the lines, grades and elevations shown on the plans as nearly as can be achieved by skillful operation of the excavating equipment.

Excavated materials, if suitable may be used to construct the embankment.

Embankment

Material. The material placed in the fill shall be free of detrimental amounts of sod, roots, stones over 6 inches in diameter, and other objectionable material. All fill material shall be obtained from required excavations and designated borrow areas. The selection, blending, and disposition of materials in the fill shall be subject to approval of the Engineer.

The contractor shall maintain the borrow area in drainable condition or otherwise provide for timely and effective removal of surface and ground waters that accumulate within the borrow areas from any source. Approved borrow material shall be processed as necessary to achieve proper and uniform moisture content for placement.

Placement. Fill shall not be placed until the required excavation and foundation preparation have been completed and the foundation has been inspected and approved.

The foundation surface shall be scarified and loosened to a depth of not less than 2 inches before placement of the first layer of fill. If the surface of any layer becomes too hard and smooth for proper bond with the succeeding layer, it shall be scarified parallel to the axis of the fill to a depth of not less than 2 inches before the next layer is placed.

The placing and spreading of fill material shall be started at the lowest point of the foundation. The fill shall be brought up in horizontal layers of a maximum of 8 inches thickness such that adequate compaction can be obtained. The fill shall be constructed in continuous horizontal layers except where openings or sectionalized fills are required. In those cases, the slope of the bonding surfaces between the embankment in place and the embankment to be placed shall not be steeper than 3 horizontal to 1 vertical. The bonding surface shall be treated the same as that specified for the foundation so as to insure a good bond with the new fill.

Embankments shall be constructed in continuous horizontal layers. The distribution and gradation of materials shall be such that no lenses, pockets, streaks, or layers of material differ substantially in texture or gradation from the surrounding material. If it is necessary to use materials of varying texture and gradation, the more impervious material shall be placed in the center and upstream sections of the fill. For zoned fills of substantially differing materials specified, the zones shall be placed according to lines and grades shown on the drawings.

The complete work shall conform to the lines, grades and elevations shown on the drawings or as staked in the field.

Moisture control. The moisture content of the fill material shall be such that the required compaction can be obtained. The moisture content shall be as uniform as practicable throughout each layer.

Material that is too wet when deposited on the fill shall either be removed or be dried to the specified moisture content prior to compaction.

If the top surface of the preceding layer of compacted fill, foundation, or abutment surface in the zone of contact with the fill becomes too dry to permit a suitable bond, it shall be scarified and moistened by sprinkling to an acceptable moisture content prior to placement of the next layer of fill.

The proper moisture content for compaction will be determined by inspection during the placement operation. The material should maintain a ball shape when squeezed in the hand. When specified, the moisture shall be maintained within 2 percentage points of optimum as determined by ASTM D-698.

As far as practicable, the material shall be brought to the proper water content in the borrow pits before excavation. Supplemental water, when required, may be applied by sprinkling the materials on the fill. Uniform distribution of the moisture shall be obtained by discing, blading or other approved method prior to compaction

Compaction. Construction equipment shall be operated over the areas of each layer of fill to ensure the required compaction as shown on the plans. Special equipment shall be used, if needed, to obtain the required compaction.

Fill adjacent to structures and pipe conduits shall be compacted to a density equivalent to that of the surrounding fill by means of hand tamping, manually directed power tampers, or plate vibrators. Heavy equipment shall not be operated within two feet of any structure.

Compaction shall meet the requirements of the method specified as described below:

A. Sheepsfoot roller - the maximum layer thickness shall be 8 inches before compaction. The roller shall have staggered, uniformly spaced tamping feet and be equipped with suitable cleaners. The weight of the roller shall not be less than 2,500 pounds per foot of width. The maximum speed of the compaction equipment shall be 3 miles per hour. The entire surface of each layer placed should receive 6 passes of this equipment to attain the necessary compaction.

B. Pneumatically tired equipment - The maximum layer thickness before compaction shall be 6 inches. A loaded scraper may be considered a pneumatic roller. The wheels of this equipment must pass over 90 percent of the surface of each lift before a new lift is placed.

C. Track laying equipment (bulldozer) - The maximum layer thickness before compaction shall be 4 inches. The tracks of the equipment must pass over 90 percent of the surface of each lift before a new lift is placed.

D. Compaction shall result in densities equal to or greater than 95 percent of the maximum obtained by laboratory compaction at optimum moisture of like soils in accordance with the procedure given in ASTM D-698, Procedure A.

E. Compaction shall result in densities equal to or greater than 90 percent of the maximum obtained by laboratory compaction at optimum moisture of like soils in accordance with the procedure given in ASTM D-1557, Procedure A.

Heavy compaction equipment shall not be operated within 2 feet of any structure. Hand directed tampers or compactors shall be used on areas not accessible to heavy compaction equipment, and within 2 feet of any structure. Fills compacted in this manner shall be placed in layers not greater than 4 inches in thickness before compaction, and shall meet the same density requirement as for the adjacent area.

Compliance with this compaction requirements will be determined by the procedure given in ASTM D-1556 or D-2167 for methods D and E and by observation of performance for methods A, B, and C.

Fill not meeting the specified requirements shall be reworked or removed and replaced with acceptable fill.

BACKFILL AROUND STRUCTURES

Materials. The fill material shall be free of organic matter and other objectionable material. Backfill material around pipes shall contain no rocks greater than 1 inch.

Placement. Selected backfill material shall be placed around structures and pipe conduits at about the same rate on all sides to prevent damage from unequal loading.

The placing and spreading of fill material shall be started at the lowest point of the foundation. The fill shall be brought up in horizontal layers of such thickness that adequate compaction can be obtained.

Fill adjacent to structures and pipe conduits shall be compacted to a density equivalent to that of the surrounding fill by means of hand tamping or manually directed power tampers or plate vibrators.

The passage of heavy equipment will not be allowed:

1. over cast-in-place conduits prior to 7 days after placement of the concrete; or
2. over any type of conduit until the backfill has been placed above the top surface to a height of 2 feet.

Compacting of fill adjacent to structures shall not be started until 7 days have elapsed since the placement of the concrete.

The fill shall be placed in a manner adequate to prevent damage to the structure and allow the structure to gradually and uniformly assume the backfill loads. The fill shall be placed in not more than four-inch thick layers.

Moisture Content. Water shall be added to the fill material, if necessary, to obtain the proper moisture for compaction. The soil moisture of the fill material shall be sufficient to hold a ball shape when squeezed in the hand, unless otherwise stated and shown on the drawings.

Compaction. The fill material shall be compacted to a density equal to that of the adjacent materials. Compaction shall be accomplished by hand tampers or other acceptable means. Heavy equipment shall not be operated within two feet of any structure.

Surface drainage. After the backfill operations have been completed, the surface area shall be graded to convey any surface runoff away from the structure

VEGETATIVE COVER

A protective cover of vegetation shall be established and maintained on all exposed surfaces of the embankment borrow areas and spoil disposal areas in accordance with the Hawaii standard and specification for Critical Area Planting (342).

Seedbed preparation, seeding, fertilizing, and mulching shall be as shown on the plans.

WARNING SIGN AND FENCING

A warning sign shall be posted in a clear visible location to warn that the structure may contain poisonous gas and hazardous material. A fence will be constructed around the facility to prevent unwanted entry.

BASIS OF ACCEPTANCE

The acceptability of this practice shall be determined by inspections to insure compliance with all the provisions of this specification and to the drawings.

WORKMANSHIP

All construction shall be performed in a workmanlike manner, and the job site shall have a neat appearance when finished.

All disturbed areas not graveled or paved will be vegetated to control erosion.

CONSTRUCTION OPERATIONS

Construction operations shall be carried out in such a manner and sequence that erosion and air and water pollution are minimized and held within legal limits.

The owner, operator, contractor or other persons will conduct all work and operations in accordance with proper safety codes for the type of construction being performed with due regards to the safety of all persons and property.

SAFETY

Landowners or operators, sponsoring organizations, and contractors shall be liable for damage to utilities and damage resulting from disruption of service caused by construction activities. The Natural Resources Conservation Service makes no representation on the existence or nonexistence of any utilities. Absence of utilities on the drawings is not assurance that no utilities are present at the site.

It is the responsibility of the landowner or operator to determine if there are buried or overhead utilities in the vicinity of the proposed work. They should take proper procedures to insure that the utilities shall not be jeopardized and that equipment operators and others will not be injured during construction operations.